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REMARKS

Claims 1-21 are pending in the present application. In the restriction requirement dated January 18, 2006, the Examiner identified two alleged inventions in the pending application including Group I consisting of claims 1-8 drawn to an MR apparatus and classified by the Examiner in class 324, subclass 312, and Group II consisting of claims 9-20 drawn to a method of MR imaging and a computer readable storage medium and classified by the Examiner in class 324, subclass 309.

After Applicant's election of claims 1-8 with traverse dated February 15, 2006, the Examiner made the restriction final in the Office Action dated March 22, 2006. Subsequently, Applicant attempted to amend claim 1 in the response dated June 21, 2006. In the Final Office Action dated August 18, 2006, the Examiner refused entry of any amendments to claim 1 and alleged that "an entirely new search is necessary, making the amendment to claim 1 independent from the apparatus originally presented." *Final Office Action*, 8/18/2006, pg. 2.

In fact, the apparatus of alleged invention I is actually generic to that which the Examiner has identified as invention II. Accordingly, Applicant believes the Restriction is improper and request Supervisory Review thereof.

MPEP § 806.04 states:

"[w]here an application includes claims directed to different embodiments or species that could fall within the scope of a generic claim, restriction between the species may be proper if the species are independent or distinct. However, 37 CFR 1.141 provides that an allowable generic claim may link a reasonable number of species embraced thereby. The practice is set forth in 37 CFR 1.146. *MPEP § 806.04 (emphasis added)*.

Furthermore, the MPEP states that, "***[i]n general, a generic claim should *>require< no material element additional to those **>required by< the species claims, and ** each of the species >claims must require all the limitations of the generic claim<." MPEP § 806.04(d).

That called for in claims 9-20 is not "independent or distinct" from claim 1, and that called for in claims 9-20 requires all the limitations of claim 1.

Claim 1 in its original form calls for, in relevant part, determining, in real-time, a respective flip angle for each data acquisition pulse of a pulse sequence for multi-echo acquisition of MR data matched to a given target tissue and a given scan prescription to reduce ringing artifacts from amplitude decay of the multi-echo acquisition.

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Claim 9 calls for, in relevant part, a method of MR imaging comprising determining a target amplitude for a majority of echoes of the multi-echo acquisition, and determining a flip angle for each data acquisition pulse of the multi-echo acquisition to acquire MR data such that, for the majority of the echoes of the multi-echo acquisition, a maximum echo amplitude is substantially equal to the target amplitude.

Claim 15 calls for a computer readable storage medium having a computer program stored thereon and representing a set of instructions that when executed by a computer causes the computer to determine a target amplitude versus echo train time relationship for a multi-echo acquisition of MR data from a given target tissue, determine a desired maximum amplitude for a plurality of echoes of the multi-echo acquisition for a user-prescribed MR scan from the target amplitude versus echo train time relationship, and determine a flip angle for each data acquisition pulse of the prescribed MR scan such that the plurality of echoes has a maximum amplitude substantially equal to the desired maximum amplitude.

In the response dated June 21, 2006, Applicant amended claim 1 in part by deleting the generic clause "to reduce ringing artifacts from amplitude decay of the multi-echo acquisition" and replace it with the more specific clause "such that a target amplitude for a majority of echoes in the multi-echo acquisition is substantially uniform and a maximum echo amplitude of the majority of echoes is substantially equal to the target amplitude." As stated above, the Examiner refused entry of the amendments to claim 1. The Examiner stated:

[T]he apparatus (invention I) originally claimed in claims 1-8 and the method and computer program claimed in claims 9-20 are two separate inventions because the originally claimed apparatus in claims 1-8 does not require setting the target amplitude to the maximum echo amplitude, therefore the restriction filed on 3/22/2006 stands and is considered final. *Id.*

Applicant respectfully disagrees that that called for in claims 1-8 and claims 9-20 are two separate inventions because the originally claims 1-8 do not require setting the target amplitude to the maximum echo amplitude.

Ringing artifacts may occur in MR imaging due to, among other things, amplitude decay during a multi-echo acquisition. Amplitude decay may be reduced by setting "a maximum echo amplitude [is] substantially equal to the target amplitude" as called for in claim 9 or by having a plurality of echoes having "a maximum amplitude substantially equal to the desired maximum amplitude" as called for in claim 15. Either of the techniques called for in claims 9 and 15

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"reduce ringing artifacts from amplitude decay of the multi-echo acquisition" as called for in claim 1.

In other words, that which is called for in claim 1 is generic to that called for in claims 9 and 15. Claim 1, the generic claim, requires "no material element additional to those required by the species claims" as stated in the MPEP. Claims 9 and 15 call for, more specifically, a maximum echo amplitude to be substantially equal to a target amplitude, which is but one way to reduce ringing artifacts from amplitude decay.

The Examiner stated "the originally claimed apparatus in claims 1-8 does not require setting the target amplitude to the maximum echo amplitude." Essentially, it appears that the Examiner here is stating that the subject matter of claim 1, lacking this element, is a generic way to reduce ringing artifacts and that setting the target amplitude to the maximum echo amplitude is one specific way to do so. That called for in claim 1 is thereby generic to that called for in claims 9 and 15.

Clearly the scope of material as called for in claims 9 and 15 falls within the purview of that called for in independent claim 1, thus making claim 1 generic to claims 9 and 15 and their dependent claims. Accordingly, claims 9 and 15 are directed to "embodiments or species that could fall within the scope of a generic claim" and are not "independent and distinct" therefrom. According to MPEP § 806.04(d), "[o]nce a **>generic claim is allowable<, all of the claims drawn to species in addition to the elected species which *>require< all the limitations of the generic claim will ordinarily be * allowable >over the prior art< in view of the *>allowability< of the generic claim, since the additional species will depend thereon or otherwise *>require< all of the limitations thereof." MPEP § 806.04(d). As such, because Applicant believes claim 1 is believed generic to the scope of material called for in claims 9-20, Applicant thereby requests rejoinder of claims 9-20.

In addition, in the restriction, the Examiner concluded that groups I and II are distinct because they are related as process and apparatus for its practice under MPEP § 806.05(e), which states that a "[p]rocess and apparatus for its practice can be shown to be distinct inventions, if . . . the apparatus as claimed can be used to practice another * materially different process." MPEP § 806.05(e) further states that "[t]he burden is on the examiner to provide reasonable examples that recite material differences." The Examiner stated that "the MRI apparatus can be used to practice another materially different process such as a method of MR imaging wherein the flip angle is determined without the use of a maximum echo amplitude equal to a target/desired amplitude."

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Office Action, Jan. 18, 2006, p. 2. However, the Examiner's example fails to provide a reasonable example that recites a material difference.

The Examiner's removal of the maximum echo amplitude to be substantially equal to the target/desired amplitude is not materially different from the processes of claims 9 and 15. That is, with the maximum echo amplitude element removed, claims 9 and 15 still call for, in part, a target/desired amplitude determined for a majority/plurality of echoes of a multi-echo acquisition and a flip angle for each data acquisition pulse is determined. For the computer of claim 1 to be programmed to determine, in real-time, a respective flip angle for each data acquisition pulse of a pulse sequence for multi-echo acquisition of MR data matched to a given target tissue and a given scan prescription to reduce ringing artifacts from amplitude decay of the multi-echo acquisition, each echo amplitude will be matched to the target/desired amplitude. As such, even if the maximum echo amplitude element is removed from the processes of claims 9 and 15, the remaining process elements call for a process not materially different therefrom.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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